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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/302,687	04/29/1999	DAVID I DIETZ	9076/102	7243

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ROGER A. HEPPERMAN
MARSHALL, GERSTEIN & BORUN
6300 SEARS TOWER
233 SOUTH WACKER DRIVE
CHICAGO, IL 60606-6402

EXAMINER

ALI, SYED J

ART UNIT PAPER NUMBER

2127

DATE MAILED: 07/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/302,687

Applicant(s)

DIETZ ET AL.

Examiner

Syed J Ali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to the response filed April 23, 2004. Claims 1-17 are presented for examination.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

Claim Rejections - 35 USC § 102

3. **Claims 1-8, 12-14, and 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Coronel et al. (USPN 6,363,294) (hereinafter Coronel).**

4. As per claim 1, Coronel teaches the invention as claimed, including an event historian for batch processing comprising:

a history executive element for receiving process event information and batch procedure event information from multiple input sources operating in different physical elements of a process (col. 8 lines 21-45; col. 10 line 50 - col. 11 line 16) and for automatically deriving relationships among portions of said process event information and batch procedure event information based on generated event messages (col. 8 lines 8-20; col. 10 line 50 - col. 11 line 16; col. 13 lines 50-62);

a storage element coupled to said executive element for persistently storing said process event information and said batch procedure event information and said derived relationships in response to requests from said history executive element (col. 13 lines 50-62); and

an event information retrieval element for retrieving said process event information and said batch procedure event information in accordance with said derived relationships in response to requests from an application process (col. 10 lines 20-30; col. 15 line 58 - col. 16 line 5).

5. As per claim 2, Coronel teaches the invention as claimed, including the event historian of claim 1 further comprising:

a continuous data collection element for gathering continuous data in real time wherein said continuous data relates to at least one procedural element of a batch process (col. 10 lines 14-15).

6. As per claim 3, Coronel teaches the invention as claimed, including the event historian of claim 2 wherein said information retrieval element further comprises:

a batch historian view client application for graphically presenting to a user said batch procedure event information and said relationships and said continuous data (Figs. 8-13).

7. As per claim 4, Coronel teaches the invention as claimed, including the event historian of claim 1 wherein said information retrieval element further comprises:

a batch historian view client application for graphically presenting to a user said batch procedure event information and said relationships (Figs. 8-13).

8. As per claim 5, Coronel teaches the invention as claimed, including the event historian of claim 1 further comprising:

a batch event generator coupled to said history executive element as a first input source wherein said batch event generator generates events indicative of execution of procedural elements of a batch process (Fig. 7, element 17"; col. 10 lines 20-30); and

a process event generator coupled to said history executive element as a second input source wherein said process event generator generates events indicative of procedural elements performed within equipment used in the control of said batch process (Fig. 7 elements 14-1 and 14-2; col. 10 lines 20-30).

9. As per claim 6, Coronel teaches the invention as claimed, including the event historian of claim 5 further comprising:

a continuous data collection element for gathering continuous data in real time wherein said continuous data relates to at least one procedural element of a batch process (col. 10 lines 14-15), wherein said process event generator comprises:

an event log generated by said continuous data collection element (col. 13 lines 50-62).

10. As per claim 7, Coronel teaches the invention as claimed, including the event historian of claim 6 wherein said history executive element includes:

a history correlation element for relating said batch events and said process events and said continuous data (col. 10 line 49 – col. 11 line 16).

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11. As per claim 8, Coronel teaches the invention as claimed, including in a batch processing system, a batch history view client application comprising:

means for retrieving batch procedure event information and process event information from multiple sources operating in different physical elements of a process corresponding to an identified batch (Fig. 7 elements 17'-1, 17'-2, and 17''; col. 8 lines 21-45); and

means for visually presenting to a user said batch procedure event information and process event information (Figs. 8-13) and automatically deriving relationships among portions of said batch procedure event information and process event information (col. 8 lines 8-20; col. 10 line 50 - col. 11 line 16; col. 13 lines 50-62).

12. As per claim 12, Coronel teaches the invention as claimed, including the view client of claim 8 further comprising:

means for retrieving other batch procedure event information corresponding to a second identified batch (col. 10 line 50 – col. 11 line 16); and

means for presenting to a user said other batch procedure event information and relationships among portions of said other batch procedure event information (Figs. 8-13) wherein said means for presenting said other batch procedure event information includes:

means for indicating differences between said batch procedure event information and said other batch procedure event information (col. 10 line 50 – col. 11 line 16).

13. As per claim 13, Coronel teaches the invention as claimed, including the view client of claim 12 wherein said other batch procedure event information represents processing of a golden

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batch for comparison with other batches represented by said batch procedure event information (col. 10 lines 50-63; col. 15 line 58- col. 16 line 5).

14. As per claim 14, Coronel teaches the invention as claimed, including the view client of claim 12 wherein said means for visually presenting includes means for presenting said batch procedure event information and said relationships in real time as said batch procedure event information is generated (Figs. 8-13; col. 10 lines 14-15).

15. As per claim 16, Coronel teaches the invention as claimed, including the view client of claim 14 further comprising:

continuous data collection means for gathering continuous data in real time (Fig. 7 elements 17'-1, 17'-2, 17''; col. 10 lines 14-15), wherein said continuous data relates to at least one data point of a batch process (Fig. 8 element 34), wherein said means for presenting said batch procedure event information in real time includes means for presenting said continuous data in real time as said continuous data is gathered (Figs. 8-13; col. 10 lines 14-15).

Claim Rejections - 35 USC § 103

16. **Claims 9, 15, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coronel in view of Hohkibara et al. (USPN 6,438,436) (hereinafter Hohkibara).**

17. As per claim 9, Hohkibara teaches the invention as claimed, including the following limitations not shown by Coronel:

the view client of claim 8 wherein said means for visually presenting further comprises:

means for presenting said batch procedure event information and process event information and said derived relationships as a Gantt chart wherein said Gantt chart is representative of procedural elements of the batch procedure (col. 7 lines 44-52; col. 8 lines 1-12).

18. It would have been obvious to one of ordinary skill in the art to combine Coronel with Hohkibara since the Gantt chart of Hohkibara enables the operator to monitor various permutations of production stages of a batch, including the individual process steps or overall batches (see Figs. 8, 11). The batch process can be broken up into process steps, each of which can be monitored individually. Additionally, Coronel teaches displaying aspects of a production in relation to certain "alarm" signals within a time relative scale to a user, but does not seek to implement the display within a Gantt chart. Using a Gantt chart allows multiple process steps to be monitored simultaneously, while the production time of all wafers and batches would be available from the supervisor provided by Coronel. The combination of Coronel and Hohkibara would provide an improved method of displaying batch process event information to a user and allowing a user to manipulate that data to monitor a batch production.

19. As per claim 15, Hohkibara teaches the invention as claimed, including the view client of claim 14 wherein said means for presenting said batch procedure event information in real time includes means for scrolling said batch procedure event information horizontally across a user display screen (col. 8 lines 1-12).

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20. As per claim 17, Hohkibara teaches the invention as claimed, including the view client of claim 16 wherein said means for presenting said continuous data in real time includes means for scrolling said continuous data horizontally across a user display screen (col. 8 lines 1-12).

21. **Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coronel in view of Hohkibara in view of Cartsonis et al. (USPN 6,584,501) (hereinafter Cartsonis).**

22. As per claim 10, Cartsonis teaches the invention as claimed, including the following limitations not shown by Coronel or Hohkibara:

the view client of claim 9 wherein said means for presenting said batch procedure event information and process event information and said derived relationships as a Gantt chart further comprises:

means for presenting said Gantt chart in an absolute time (col. 1 line 59 - col. 2 line 9).

23. It would have been obvious to one of ordinary skill in the art to combine Coronel, Hohkibara, and Cartsonis since the modification of the chart of Hohkibara to allow the user to specify a relative time or absolute time allows greater management capabilities and troubleshooting possibilities. For an ongoing process it may be desirable to display the Gantt chart in an absolute time scale, such that the current process can be monitored for deviations from a typical batch and corrections can be made on the fly. Contrarily, by way of example, a completed process that produces defective wafers could be retroactively studied to determine at what point a batch deviated from what was expected relative to a known good batch. Coronel

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and Hohkibara disclose the monitoring of batch processes and relating the data corresponding to those productions in a Gantt chart. The functionality of a chart is not restricted to the process it is monitoring, and thus the charting method used by Cartsonis is relevant to the similar Gantt chart provided by Hohkibara.

24. As per claim 11, Cartsonis teaches the invention as claimed, including the view client of claim 9 wherein said means for presenting said batch procedure event information and process event information and said derived relationships as a Gantt chart further comprises:

means for presenting said Gantt chart in a relative time scale (col. 1 line 59 - col. 2 line 9).

Response to Arguments

25. Applicant's arguments filed April 23, 2004 have been fully considered but they are not persuasive.

26. Applicant argues on page 6, "*Claim 1 recites, in part, a history executive element 'for automatically deriving relationships among portions of said process event information and batch procedure event information based on generated event messages'. Coronel does not teach or suggest these elements of Claim 1. Coronel relies upon manual configuration of the database by human process engineers.*" Applicant later adds, "*Coronel also relies upon manual configuration of the alarms.*"

27. Although Coronel teaches manual programming of the database to establish the analysis rules that generate the alarms, the actual derivation of relationships of the batch production is automatic once the configuration is complete. Claim 1 specifically recites “automatically deriving relationships among portions of said process event information and batch procedure event information based on generated event messages”, which does not take into account or limit the manner in which the history executive element is initially created or modified. Conceivably, the production rules and analysis techniques may be predefined or manually created, and still fall within the scope of the claim as it is presented. In Coronel, once the process engineers have configured the database with the analysis rules, the algorithms are used to monitor the production process and automatically generate alarm messages when deviations occur (col. 7 line 59 - col. 8 line 7). This step requires no user interaction after the initial configuration. Furthermore, relationships are generated between portions of the process event information to further monitor the production process and ensure that action can be taken to correct the deviation (col. 8 lines 7-20).

28. Applicant argues on page 7, *“Coronel’s mere mention that the batch history may be used for statistical purposes provides no enabling teaching or suggestion of how to actually use the statistical information beyond computing an average..., and a vague discussion of how the statistics could be of ‘great value’.”* Applicant later adds, *“none of the information in Coronel teaches or suggests ‘automatically deriving relationships’ among portions of said process event information and batch procedure event information ‘based on generated event messages’.”*

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29. The “automatically deriving relationships among portions of said process event information and batch procedure event information ‘based on generated event messages’” is performed by Coronel within the supervisor, which monitors the production equipment. Coronel teaches that the supervisor monitors the production process on an ongoing basis, and continually compares the data to historical data to identify deviations (col. 10 line 50 - col. 11 line 16; col. 13 lines 19-62). If such a deviation occurs, an “alarm” is generated, which corresponds to the claimed “generated event messages”. This alarm triggers an action to be undertaken in an effort to correct the identified problem. Simultaneously, the data that triggered the alarm is identified and stored in the database, including how the production process deviated from what was expected col. 10 line 50 - col. 11 line 16). This comparison between the erroneous data and the acceptable data corresponds to the claimed “automatically deriving relationships”, wherein the relationship is stored in the database for further analysis, such that another occurrence of the same error may be avoided.

30. Applicant argues on page 8, *“The mere fact that Coronel and Hohkibara both involve wafer production would not motivate one of skill in the art to add Hohkibara’s Gantt charts to Coronel’s wafer fabrication process in order to create a ‘means for presenting said batch procedure event information and process event information and said derived relationships as a Gantt chart wherein said Gantt chart is representative of procedural elements of the batch procedure’ as recited, in part, by Claim 9 because there is no teaching or suggestion in either Hohkibara or Coronel of presenting ‘batch procedure event information’ or ‘derived relationships’ using Gantt charts.”*

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31. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Coronel teaches monitoring a production process, and displaying to a user the relationship between an ongoing production and the desired conditions. However, this display is limited to one aspect of the process at a time. It would be desirable to view multiple relationships simultaneously, particularly if more than one aspect of the production has failed or deviated. In reference to Figs. 8-13 of Coronel, it is conceivable that more than one of these error conditions may occur at the same time. That is, the supervisor monitors the production process for various criteria (col. 10 line 50 - col. 11 line 16), and when a rejection criteria arises, generates a graph depicting the monitored signals with the appropriate erroneous signals (col. 11 line 23 - col. 13 line 18). In this case, the user may wish to view how various aspects relate to each other and troubleshoot accordingly. The charting mechanism of Hohkibara would provide exactly this feature. The use of a Gantt chart, as in Figs. 8 and 11 of Hohkibara, rather than the individual signal plots used by Coronel, would provide more flexibility in troubleshooting errors. The Gantt chart of Hohkibara is capable of depicting error conditions as well, as the process management system has a quality control component that monitors the production process according to certain criteria (col. 9 lines 13-44). The charts are able to be manipulated by a user

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(col. 9 lines 1-12), thereby allowing the operator to see where error conditions may have arisen, and take appropriate action.

32. Applicant argues on page 8, *"the mere existence of a Gantt chart in Hohkibara does not teach or suggest 'presenting said batch procedure event information and process event information and said derived relationships as a Gantt chart wherein said Gantt chart is representative of procedural elements of the batch procedure'"*.

33. Examiner respectfully disagrees. Hohkibara demonstrates a quality control mechanism that allows automatic monitoring of a production for errors or failure. This failure is then relayed to the user to take appropriate action (col. 9 lines 13-44; col. 9 line 64 - col. 10 line 7). Although it is not specified how this information is presented to the user or operator, it is highly conceivable to use the Gantt chart mechanism that is used throughout Hohkibara. When considered in combination with Coronel, which monitors a production process for deviation criteria in a similar fashion and relays the corresponding error signals to the user in a time scale fashion (col. 10 line 50 - col. 11 line 16; Figs. 8-13), the Gantt chart of Hohkibara is a perfect fit for showing how errors in various components relate to each other such that appropriate action may be taken.

34. Applicant argues on page 9, *"Applicants respectfully submit that the combination of Cartsonis with Coronel and Hohkibara is improper because there is no motivation to combine the references. One of skill in the art would not be motivated to combine Cartsonis's computer network data traffic analyzer with Hohkibara's production scheduling system or Coronel's wafer*

fabrication process because there is no suggestion in either Cartsonis or Hohkibara of the desirability or relevance of a computer network data traffic analyzer. Also, the mere mention of Gantt charts in Cartsonis and Hohkibara provides no motivation to combine the references as their uses of the Gantt charts are completely unrelated to each other and provide no suggestion as to the desirability of such a combination."

35. Examiner respectfully disagrees. In particular, Coronel and Hohkibara individually teach the use of a relative time scale and an absolute time scale, respectively (see Figs. 8-13 of Coronel and Figs. 8, 11 of Hohkibara). Cartsonis is merely provided as demonstrating how Gantt charts may be used to indicate the same process in a relative or absolute time scale. The combination of Coronel, Hohkibara, and Cartsonis would allow the troubleshooter to evaluate error conditions in any manner they see fit. For example, if viewing the data signals from two separate productions, using an absolute time scale would be irrelevant. One data set would not correspond to the other, and the data would be useless to the troubleshooter. However, using a relative time scale allows the signals to be evaluated as to how one signal corresponds to the other at the same point in the production process. Thus, the flexibility in specifying the time scale is essential to proper troubleshooting. The fact that Cartsonis is related to computer network data traffic is not relied upon. In addition, Cartsonis teaches the technique enables the user to quickly identify application behavior, including faults and timing gaps. Therefore, the charting mechanism is of particular relevance to the production process monitoring of Coronel and Hohkibara.

Conclusion

36. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (703) 305-8106. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (703) 305-9678. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali
June 30, 2004



LEWIS A. BULLOCK, JR.
PRIMARY EXAMINER